DATA PROCESSING DIGEST

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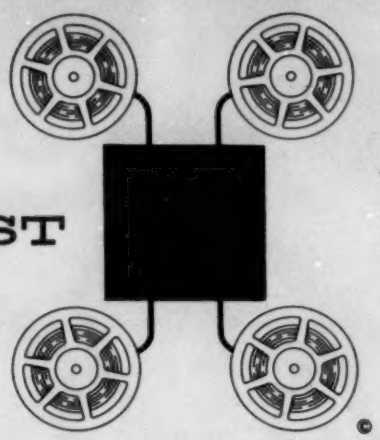

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General Information

HOW DO YOU MEASURE USEFUL COMPUTER TIME?

AUTOMATIC DATA PROCESSING, March 1960; pages 14-17

Measurement of "good" and "bad" computer time is not easy. Some activities may be considered "good" (i.e. productive) and others "bad" (or non-productive), while some may be open to doubt or regarded as neither. The activities are grouped under these headings: preventive maintenance, actual production runs, development of programs, time lost due to computer faults, repair time of computer faults, time lost due to operator or programer errors, idle time, miscellaneous occurrences.

"Maintenance time should not be considered 'good' or 'bad' time or time when something 'worthwhile' could have been done, because this would cause maintenance to be rushed, with eventual bad results for the installation. It has to be decided, however, whether it is removed entirely from the total number of hours that machine is switched on...in order to calculate the correct percentage of 'good' time."

Since successful production runs are regarded as "good" time, management will want to increase the hours occupied by such runs. In order to do this, the opportunity must be provided to develop good programs. Such development periods "may be considered 'good' time, even though the development may not always be successful because of errors in programming or problem analysis....If in the course of production or development runs a computer fault occurs that requires the re-running of the program from the beginning or some intermediate point, how should the time spent in the original run be treated? It can either be deemed 'good' time since the computer was working correctly then, or 'bad' time because the job has taken longer to run than scheduled because of a computer fault.

"If a computer fault develops that cannot be quickly cleared by the operator the delay before the engineer arrives to start his investigation should be recorded as 'bad' time. Also naturally the time required to repair the fault...must be logged as 'bad.' This raises the point of whether downtime on computer input/output equipment, when the central

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"Good" and "bad" depends on management's definition

computer is still capable of being used, should be regarded as 'bad' computer time or not. It seems best to take the view that management is trying to measure the efficiency of the computer system as a whole, and therefore electronic or electromechanical faults in magnetic tape units, paper tape equipment, card machines and printers can be booked as 'bad' time to the system."

Should time lost because of an operator or programer error be considered "good" or "bad"? "In as far as the percentage utilisation statistics are a measure of the computer's reliability and the engineer's skill, this time can be regarded as 'good'--but a separate logbook column should be used to collect such occurrences. In so far as the statistic measures the useful time of the computer and is not held against the engineer, these stoppages can be regarded as 'bad' time."

Idle time may be eliminated by the gong

Idle time, defined as time when the computer is switched on and available for use but is not being used for any job, would seem to be "good" time wasted. On the other hand, there is no way to know whether, if the computer were being used, it would have developed a fault and so created "bad" time. It would be well for management to "pay careful attention to the amount of idle time and reduce it to a minimum by a careful system of allocating time to programmers. One IBM installation where there are many people wishing to test programs has devised a gong to sound every 10 seconds of idle time, and it is remarkable how soon a programmer approaches."

An illustration of efficiency percentages calculated by various methods is given. By one method, excluding maintenance, idle and overtime, and treating operator and programer errors as "good" time, the efficiency rating is 88 percent. By the second method, excluding maintenance but including idle and overtime in the available time, the rating is 68 percent. "Thus we have...two very different figures for the same set of circumstances! It is obviously wrong, therefore, for management without knowing the formula used, to think that a large percentage is evidence of better utilisation or reliability."

It is suggested that manufacturers get together, possibly under the auspices of The British Computer Society, and "settle a formula that could be used for all installations and produce strictly comparable figures."

DISTRIBUTION AND ELECTRONIC DATA PROCESSING: "MARRIAGE" WITH PROBLEMS

Jerome P. Shuchter, Federal Pacific Electric Co., Newark, N.J.
COMPUTERS AND AUTOMATION, March 1960; pages 9-14

The errors made by the Federal Pacific Electric Company in setting up their IBM RAMAC 305 system are discussed. These are summarized as:

1. The pedestal error, in which the equipment is "set up on a pedestal and expected to perform magical maneuvers."

A frank admission of errors

2. The "leave-it-to-experts" error, in which "the working-out of problems is left to the experts who solve problems expediently rather than in depth.
3. The "remote control error," in which "executive administration of the system deteriorates into passing on procedures rather than shirt-sleeve participation."

"The results in the case of Federal Pacific were: 1) The procedures established were much too elaborate, much too sophisticated, for the stage of development of the company's distribution system; 2) the voluminous reports were fraught with error and inadequate for action; 3) the installation failed to enlist the cooperation and support of the people who had to work with it."

Corrective steps were: 1) tightening of internal paperwork, with an upgrading of personnel at the source of records, and improved formal methods; 2) responsibility assigned to a corporate officer; 3) simplified methods, and gradual change to more sophisticated methods; 4) frequent human intervention to check on machine processing; 5) evaluation and planning of further uses of the equipment to forestall repetition of past errors.

PROBLEMS CONCERNING EDPM

W. J. Kennevan, Office of Comptroller of the Navy
THE ARMED FORCES COMPTROLLER, March 1960; pages 34-38

"The problems concerning EDPM lie primarily in the areas of systems development, organization, and performance evaluation.... No matter at what level or by whatever organizational element or committee a study is undertaken, the Comptroller must be involved if financial procedures are to be included...."

Performance review required after first year of operation

Department of Defense directives require that "within one year following the installation of an electronic computer ((within the Armed Forces)) for business-type operations, a representative of Secretary of Defense and Navy Management Office must conduct an on-site performance review to verify the benefits being obtained.... This on-site performance review will be interested in these basic items:

1. An explanation of management benefits resulting, or anticipated, from the installation of EDP....
2. Annual operating costs of the Data Processing organization....
3. Personnel and equipment reductions resulting from installation of the system....
4. The cost of data processing as projected in the feasibility study versus the actual....
5. Finally, the one-time non-recurring costs...."

HOW TO MAKE A FEASIBILITY STUDY

P. T. Bridgeman, Urwick Diebold Ltd.
AUTOMATIC DATA PROCESSING, March 1960; pages 32-35

This is the third in the series of articles on organization and procedure of a feasibility study. ((See DPD: March 1960, page 8, "When Is a Feasibility Study Feasible?" and April 1960, page 4, "Off the Mark to a Feasibility Study."))

Judge the study by the answers to these questions

How detailed should the feasibility study be? One way to handle this problem is to "draw up as part of the terms of reference of the study team, a list of questions to be answered. The adequacy of the study can then be judged by the answers given. Answers adequately supported by facts should be given to the following:

a) What computer applications exist in the data processing activities of the organization?
b) Can a computer cope with the volume of data to be processed and produced?
c) What advantages are to be gained from a computer?
d) What economies can be expected?
e) Which range of equipment is most appropriate and what specific units are needed?
f) What effect would the new system have on the organisational structure and on personnel?
g) What costs and complications are expected in introducing the automatic system?
h) What should be the detailed plan for introducing the proposed system and how long will introduction take?"

Steps for the feasibility study

The feasibility study may be thought of in the following steps:

a) Select possible application areas.
b) Study selected areas in detail to determine: 1) the information flowing in, 2) the information referred to, 3) the information produced.
c) Ascertain management's needs and objectives in the areas.
d) Relate the areas to each other and examine possibilities of rationalizing and integrating.
e) Establish detailed costs for the present system, and estimates for providing the additional needs and objectives.
f) Design the broad data processing system.
g) Prepare a system specification on which manufacturers can prepare proposals for equipment requirements.
h) Compare manufacturers' proposals based on the specification and select the most suitable range of equipment.
i) Draw up a plan for conversion to the automatic data processing system.
j) Prepare a case for the most suitable computer based on economic and other factors.

"Division of data processing activities into application areas is not usually difficult provided existing divisions of responsibility are

disregarded. Groups of activities tend to 'hang together' because they operate on the same data, e.g. 1) customer accounting and sales statistics; 2) production control and material/stock control; 3) payroll and labour cost control.... The area of most significance is usually fairly obvious--it will probably have the greatest concentration of clerical staff....As a general rule, if a computer cannot be justified in the most important areas the possibility of making a case for areas of less potential is doubtful."

Examine documents and reports in use and required

In studying the information flowing through the selected areas, the following should be recorded for all documents in use: 1) the function of the document, 2) how it is used, 3) the number of copies, 4) source, 5) ultimate destination of each copy, 6) retention period, 7) volume of use in normal and peak activity, 8) the number of alphabetic and numeric characters required for each item on the form, 9) where codes are used, full details of coding methods.

"It is very effective in examining the production of reports and statistics to start with the end-product, i.e. the forms and information produced and to trace the flow of information back to the point where it stems from other routines, e.g. sales statistics, based on orders might be traced back to the sales order routine."

For each report the following should be determined:

1) What determines when it should be issued?
2) With what other information or report do its contents have to be reconciled?
3) Is production of the report dependent on some other report?
4) What real purpose does it serve?
5) What is the actual size of the return?
6) If the report contains cumulative data, what maximum period of accumulation is practicable?
7) If accumulations or comparisons are included, what effects are code changes likely to have?
8) What is the time taken to produce the document after the last event recorded?

In determining management needs and objectives, it will be helpful to "take the information produced in the present system and to discuss its use with recipients. This will normally reveal that much of the information is not presented in the most suitable form. It is also likely to reveal additional requirements and objectives." Having determined the needs and objectives, "they are related to the records of existing systems which have been compiled to see if the present system can be adapted to provide them."

By now, full information on the selected application areas will have been collected. "The next step in the feasibility study is to utilise this mass of information for the construction or rough design of a possible automatic system that will satisfy the needs met by the existing system and provide the additional benefits expected of an automatic system." The next article in the series will cover this phase.

WHAT'S AHEAD IN BANK AUTOMATION

Neal J. Dean, Booz, Allen & Hamilton
Paper presented to Annual Conference of Bank Correspondents

This paper was presented to the Annual Conference of Bank Correspondents meeting in St. Louis, November, 1959. The author says that by 1961-62 several of the large banks will have fully automatic systems using magnetic ink character recognition (MICR). From 1961 to 1965 there should be a large number of fully automatic systems for demand deposit accounting. Such systems will prove to be economical for banks with 40,000 "on-us" transactions a day, and in some cases, where the volume is less than this. This criterion would apply to most of the commercial banks with assets of a quarter of a billion dollars or more, however banks somewhat smaller than this have found this kind of a system economically attractive.

Mechanization of the transit operation will be most profitable when a large number of banks are using magnetic ink encoding of their ABA and transit routing number. It will probably be 1965 before the number of automatic transit operations will be very significant in number. This is the type of operation anticipated:

Dollar amount encoded as by-product of proofing

"As a by-product of the proof of deposit operation, both the transit and "on-us" checks will be encoded for dollar amount. Hopefully, most of our transit items will be previously encoded with the ABA number.... A 'programmed' type of sorter [would sort]the transit checks into the proper destination groupings. This sorter would also be provided with a lister." Checks should be given a batch number in gang operation to identify the batch in subsequent operations.

The system can be expanded to include other bank operations. "If there is a sufficient space provided in the demand deposit account numbering system, or at least in the 'on-us' area at the bottom of the check, then the same type of system could be used for processing other bank operations media, such as savings deposits and withdrawals, loan payments, check credit, corporate and personal trust transactions, and general ledger transactions."

Opportunities for smaller banks would be the forming of cooperatives, or, perhaps more practically, working through existing correspondent relationships. In this kind of a system "all clearings, cash letters and mail deposits for all members of the group could be sent directly to the data processing center where they would be processed, posted and returned, together with a trial balance of the individual bank's accounts, to the member banks before the opening of the bank on the following business day. The counter items received by members of the group would be sent to the data processing center directly from the teller proof. It is visualized that the teller proof function would be accomplished on a unit encoder type of proof machine.... available today for about $3000. At some point we might consider a broadening of the type of items transmitted from the teller to data processing...including all items handled by the teller."

Priority would be given certain operations, such as deposit accounting, "so that items, trial balances, and exception reports may be returned to the member banks before the beginning of the following business day.... the high priority functions would be handled on a late evening to early morning shift. Other less pressing functions, such as loan payments, Christmas Clubs, general ledger accounting, and trust accounting, would be processed during the daylight hours."

Several of these group installations should be in operation some time in the late 60's. Cost figures should be roughly $200,000 annually. For the future, the author visualizes business and industrial organizations keeping financial data in machine language form and transmitting it, not to the employee, supplier, or government, but directly to the banks, where fund transfers for affected accounts would follow automatically. The author foresees the "probability of our banks of 1980 or 1990 becoming financial and data processing utilities rather than the paper mills of today."

Will banks become financial utilities?

For further information about the paper, write to the author at Booz, Allen & Hamilton, 380 Madison Ave., New York 17, N. Y.

EDP IN THE RETAIL INDUSTRY

Ethel Langtry, Retail Research Institute, NRMA
SYSTEMS & PROCEDURES, February 1960; pages 30-34

Electronic data processing has lagged in the retail industry for several reasons: misunderstanding by retailers of the capabilities of EDP equipment, and equipment which is too expensive and too complicated or unsuited to retail operation. The Retail Research Institute Electronics Committee of the National Retail Merchants Association (NRMA) has been working on these problems for several years.

Many retailers believe that the first retail function to be automated should be merchandising, rather than office functions such as accounts receivable, which involve the touchy area of customer relations. The opposite view is held by others. How to reconcile these two points of view is one of the problems faced by the Electronics Committee.

Automate merchandising first

Data input is one of the primary problems. While point-of-sale recorders seem the obvious answer, present equipment falls short. One need which has not been met in point-of-sale recorders is the ability to correct a portion of the input data, in the event the clerk makes an error. She must void the entire operation and begin over. Personnel training in the use of these devices is another problem, particularly sensitive in the peak seasons when temporary help is used. Other requirements which present devices lack are alphabetic information and production of hard copy. In addition, present prices are too high for the number of devices which must be installed. The average is $4 to $5 thousand each. A store with a volume of about $50 million per year would require about 500 point-of-sale recorders at a total cost of about $2 million.

Stores are now thinking of character-recognition as an answer to the input problem, possibly of the optical type. The industry believes that once the input problem is solved, any number of currently available pieces of equipment now available or being developed can be used in the over-all job.

THE TEXTILE INDUSTRY SWINGS TO DATA PROCESSING

MANAGEMENT AND BUSINESS AUTOMATION, March 1960; pages 18-21, 48

In a manner similar to the banking and retail industries, the textile industry has been investigating the possible application of electronic computing equipment through the Textile Data Processing Association, formed in 1957. Forty companies are members of the association. Their view of EDP is broad; in the words of their chairman, Harold E. Williams, of the American Thread Company, "For years the business man has had to work out his decisions and do his planning on the basis of masses of accumulated data.... Now, with electronic data processing, he must learn to administer not by norm, but by variations from the norm." Accordingly, there is an increasing sophistication on the part of textile management in the use of EDP equipment as a management tool. Installations have been made in the following companies: Cannon Mills, Dan River, J. P. Stevens, DuPont, Chatam, Amerotron, Greenwood Mills, Excelsior Mills, Chicopee, Cone Mills, and American Thread. An example of the way in which the textile industry is making use of EDP is the latter mentioned. The company has an IBM RAMAC 650 tape system. Billing, accounts receivable, payroll and sales analysis have been mechanized. Inventory control is currently being transferred, and production planning and budget analysis will follow.

The industry is cooperating on EDP study

In May 1957, a systems planning committee was formed, including the controller (Mr. Williams), vice presidents representing manufacturing and distribution-production, five department heads representing manufacturing, distribution-production, and accounting, plus another five consulting members. A full year was spent on the study. During this time every significant clerical operation was committed to writing, some of them for the first time. The final report pinpointed specific areas appropriate to immediate conversion to EDP as well as supplementary applications which could be added when the program was underway. The report included detailed costs and savings. The board of directors gave the go-ahead on the program, and site preparation in a 1650 square foot area in the New York headquarters began at once. The computing center staff is divided into two units--a combined programing and systems group, and a machine operating group--both headed by the data processing manager.

An automatic re-order system is being handled presently. Retail customers find included with each box of merchandise a reorder card which may be returned for automatic processing. A production control operation is being prepared, which will control the "finishing"

part of the company's operation. The computer will maintain in-process inventories at each of 21 check points in the finishing processing, and keep track of each process order as it moves through the finishing mill. "Turn-in tickets," recording each day's production, will be sent over telephone wires to New York each night. On the basis of this information, the system will update inventory files on finished goods, in-process goods, and "grey yarn." It will issue reports on departmental backlogs, machine loads, the status of process orders and other data needed for effective production scheduling. In expense and budget accounting, being planned, expense distribution cards will be created for each purchase and used to prepare expense distribution reports by department, which will be compared to the budget and analyzed.

COMPUTER INSTALLATION—WILL IT PAY TO WAIT?

Neal J. Dean, Booz, Allen & Hamilton
THE MANAGEMENT REVIEW, March 1960

This article is similar to the author's report reviewed in DPD October 1959, page 5, which was titled, "Obsolescence of Electronic Data Processing Equipment--Real or Fancied." The three types of obsolescence, functional, technological, and economic, are discussed. The relative importance of the three types of obsolescence depends upon many factors in the individual installations. Therefore, only after a company has determined its system requirements, can it consider the selection of equipment, and the problems of obsolescence.

IS IT WORTH THE COST?

C. R. Hall, DuPont Co.
CHEMICAL ENGINEERING PROGRESS, February 1960; pages 62-66

The use of a digital computer in a computer-controlled process ((such as a chemical manufacturing operation)) involves a large cost. Some examples are given of studies which sought to justify the application of computers in process control. The conclusions reached by the author are:

1. The application of a digital, internally-programed, general-purpose computer for control of a process will cost from $200,000 up.

2. There will be many chemical processes where, after comprehensive system analysis, lower cost process changes or lower cost ((than computer)) control changes (perhaps involving computational elements) may be made which will achieve the major share of the benefits that computer control would otherwise obtain.

BUY, LEASE, SHARE A COMPUTER—OR UTILIZE A SERVICE BUREAU?

Charles G. Abbott, Arthur Andersen & Co., New York
COMPUTERS AND AUTOMATION, February 1960; pages 15-18

Companies which expect to use computers for problems such as planning, scheduling or other types of decision-making will find that the programing phase is the largest part of the problem. In such cases, it is more practical to use a service bureau than to lease or buy a computer, since the actual running time is very short. "When the average workload equals about one-half a shift then it may be time to call the projects back home."

In sharing a facility with one or more organizations, these conditions should prevail: the product or service of the organizations should be similar; there should be strong backing at the presidential level; the cooperating organizations must standardize; the most indispensable personnel should be contributed to the cooperative project; a simple but binding agreement should be made on sharing the expense.

Technical obsolescence seems no longer to be a problem in the decision to buy or rent equipment. This eases the tension on the subject of long-term financing. A plan for purchase is given in the article, one which appears to be attractive when considering the purchase of an entire system and operating it on a two-shift basis for more than 52 months, which appears to be the break-even point. The fact that so many companies continue to rent indicates that they consider alternative investments as more profitable than ownership of a computer.

USING COMPUTER SERVICES IN SMALL BUSINESS

I. J. Seligsohn, C.E.I.R. Inc., Arlington, Virginia
MANAGEMENT AIDS FOR SMALL MANUFACTURERS, November 1959

Small businesses will find computer service centers of value in the same way large companies do when they install large scale computing systems. Computing center experts can be used as consultants on difficult problems, and can assist by providing both programing services and computing machine services. Costs for use of equipment are around $350 an hour. Programing costs average from $8 to $15 an hour. A copy of this leaflet may be obtained by writing to Small Business Administration, Washington 25, D. C.

NCR DATA PROCESSING CENTERS

The National Cash Register Company has plans for a nationwide network of data processing centers, the first three of which will be opened in New York, Los Angeles, and Dayton, Ohio. They will use the NCR 304 computing system, equipped with electronic check sorters and other types of bank automation equipment to provide sorting and accounting

services for banks. The centers will also be appropriate for the data processing needs of retailers and other types of businesses. ((From a news release.))

DATA CENTERS: CONTRASTING CONCEPTS OFFERED BY IBM AND RCA

OFFICE AUTOMATION NEWS BULLETIN, February 1960; pages 1-3

IBM's New York Detacenter operates on a "do-it-yourself" principle, while RCA's Data Center in New York offers a complete "systems" service. IBM charges on an hourly rate, while RCA charges for the work completed.

ELECTRONIC COMPUTERS—PRINCIPLES AND APPLICATIONS

T. E. Ivall
Published by Iliffe & Sons, Lt., London; and Philosophical Library, New York; 1960. $15.00

The first edition of this book was reviewed in DPD July 1957, page 8. The new edition is, according to the jacket, "almost entirely rewritten, most of the existing diagrams replaced by new ones.... three new chapters have also been added, dealing respectively with analogue computer circuits, the programming of digital computers, and the evolution of the more 'intelligent' machines of the future."

The author is pretty well preoccupied with the circuitry of the computer, and appears to subordinate other aspects. This may be of value to those who are technically interested in electronic equipment, and for them, this book would seem to be as good as most.

For those who are more interested in the use of computers, rather than the physical makeup of the hardware, there are many other books which are preferable.

Systems Design

SOURCE DATA AUTOMATION

NAVY MANAGEMENT REVIEW, January 1960; entire issue

Source Data Automation is the application of the techniques of automation to the source areas--where information begins. The Navy has found that SDA can be of great benefit to Navy systems in which one or more of the following conditions exist:

Repetition--data is continually reproduced from day to day and from document to document.

How to make the survey for SDA

Volume--size of the operation makes it almost impossible to handle the volume efficiently when only manual methods are used.
Deadlines--speed in processing data is very important.
Errors--errors are difficult to control in the manual system.
Bottlenecks--operations which can not keep pace with other preparations.

In surveying for SDA, certain considerations are significant:

A complete survey of the entire system is necessary since SDA generally takes the processing of data across divisional lines.
A detailed timed and cost analysis of the present and proposed system must be made in order to justify the new system.
A complete analysis of all the details in a system must be made.
The need for by-product information at any of the basic processing steps in the system should be considered.
The system analysts should know as much as is practical about the equipment capabilities and limitations.
Location of the equipment must be considered--for example, some SDA equipment is quite noisy.
Equipment already in use should be checked to make sure new equipment will be compatible.
Personnel training should be planned.
The SDA system should be tested before it is installed on a broad scale.
Provisions should be made for the larger amount of analyst assistance needed in SDA system design.
Centralization of functions may be required, necessitating some organizational changes.

FACTORY-TO-OFFICE AUTOMATION

AUTOMATIC DATA PROCESSING, March 1960; pages 24-29

Ryan Aeronautical Company, of San Diego, California, has installed a Stromberg Time Corporation Transacter system to route manufacturing information directly to a central data processing office. At present some information must be entered manually, but eventually automatic inputs will be possible in such cases as the entering of quantity counts from machine counters, scales, and other measuring devices.

At the present time, at strategic points throughout the plant, despatchers feed information concerning completion of production operations into the Transacters by means of pre-punched cards and dials. The information is transmitted in machine language to centrally located Compilers, the receiving units of the system, which record the messages on punched paper tape. The tape is then converted to punched cards which are filed to provide up-to-date information on location of orders in the shop, tell whether the orders are shortage items, and tell when

the orders are received in inventory. At present the system is used for location and status of orders in shop fabrication, identification of shortage parts from inventory, and receipt of completed order in inventory. Subsequent phases will include tool ordering and location, information concerning hold-ups, and timekeeping functions.

Management Sciences

OPERATIONS RESEARCH—A PRACTICAL INTRODUCTION FOR MANAGEMENT

The American Management Association has announced the availability of a filmstrip series titled "Operations Research--A Practical Introduction for Management." The announcement folder describes the films as "a comprehensive and non-technical filmstrip series on this management technique." The three filmstrips are:

1. Operations Research--What It Is (17 minutes)
2. Operations Research--How It Works (22 minutes)
3. Scope and Limitations (13 minutes)

A Discussion Guide is included with the filmstrips. Prices are: 1-5 sets, $85 each for AMA members, $110 each for non-members; 6-10 sets, $75 each for AMA members, $100 each for non-members.

Applications

KEY TO WIDER BANKING SERVICES

Maurice K. Heald, Harris Trust and Savings Bank, Chicago
SYSTEMS MAGAZINE, January-February 1960; pages 3-5

A Univac II system is being used by Harris Trust and Savings Bank. The computer personnel were split into four groups after preliminary training: an administrative or supervisory group; a group of four programing teams; a group to handle the details of account numbering; and a group to develop, install and operate (for an interim period) the input section. At present, keypunches linked to adding machines are the input equipment, with plans being made to add common language equipment when it becomes available.

Information from checks and deposits is sorted into account order and in ascending sequence as to dollar amount. Accounts are located

and account records updated at the average rate of two accounts per second. The computer also checks for stop payments and overdrafts, watches for drawings against uncollected funds, prepares a report of abnormal fluctuations in account balances, prepares a trial balance of all accounts whether active or inactive, and prepares for printing the customers' statements for the day. Filled statement sheets are removed from the computer files automatically and full page print-outs are made throughout the month, thus greatly reducing the work load for the printer at the month end. The bank is not on a cycled statement basis.

GROCERY MERCHANDISING

Certified Grocers of California, Ltd., uses two Burroughs 205 computers for billing and inventory control. As a by-product of these operations, Certified makes available to its 1500 member stores special reports which tell the store owners how fast certain items are moving. By using these reports, the store operator can conduct carefully controlled merchandising experiments. For members who operate more than one store, Certified provides a special format report which allows management to compare the sales of particular items at different stores. ((From a news release.))

DATA PROCESSING IN OMAHA

V. J. Skutt, Mutual of Omaha; N. Murrray Longworth, United of Omaha
BEST'S LIFE NEWS, March 1960; pages 50-53

In the past, Mutual and United of Omaha found that during the 45 days it took to print 500,000 premium notices with punched cards and address plates, there would be as many as 70,000 changes, which meant 70,000 reruns, some mismailing and other errors. With their IBM 705 system, all 500,000 premium notices can be run in just 36 hours, with a negligible number of changes and almost no errors. One million health and accident policy records are housed in 89 rolls of tape. From these tapes are computed mortality figures never before obtainable. The system also checks hospital costs against premiums, compares, and decides what is out of line.

A FIVE-YEAR SHIFT TO EDP: THE STAGES AND PROBLEMS

Earl W. Denby, Huron Portland Cement Co., Detroit, Mich.
THE CONTROLLER, March 1960; pages 114-118

The Huron Portland Cement Company began automating their office procedures by putting their repair cost system on a service bureau tab operation in 1954. Gradually they have added other applications, and then transferred them one at a time as they acquired their own equipment. They are still making use of the service bureau IBM 650 computer to which most of their procedures have been converted. They have found the service bureau of great advantage in such a gradual change from manual to machine methods.

AUTOMATION

Harry W. Kenney, Kansas City Life Insurance Company
THE INTERPRETER, February 1960; pages 1, 9, 14

The Kansas City Life Insurance Company has prepared for a system using a Univac Solid-State computer. The system includes the daily updating of an integrated master file of about 475,000 ordinary policies. The master basic record has a length of about 200 characters per policy. Trailer records add 488 characters to some records.

The system consists of the high speed Read Unit, the Read-Punch Unit, Printing Unit, and Central Processor Unit. A master punched card file will be maintained, containing about 2.6 cards per policy, in anniversary day order. Each work day, a day and one-half of the file will be processed. Output will be a printed premium notice and an updated master card which will be sent to the authorized collector for use on a cash transmittal. In addition, the system will produce punched cards for transactions such as contractural changes, loan interest billing, dividend accumulations and payments.

MEDICAL DIAGNOSIS BY COMPUTER: RECENT EFFORTS, AND OUTLOOK

Steven G. Vandenberg, Mental Health Research Institute, University of Michigan, Ann Arbor, Mich.
COMPUTERS AND AUTOMATION, February 1960; pages 12-14

Simulation, statistical analysis, and logical analysis are techniques being used in the diagnosis of a variety of mental ailments as well as in the study of social science problems. Extensive use of computer techniques in diagnosis will have legal and political hurdles, but it is the opinion of the author that such systems would minimize errors of judgment and eliminate the element of personal bias in diagnosis.

Programing

COBOL—COMMON LANGUAGE FOR COMPUTERS

Robert W. Bemer, IBM Corporation
MANAGEMENT AND BUSINESS AUTOMATION, March 1960; pages 22-24, 37-39

The two basic elements in COBOL (Common Business Oriented Language) ((see DPD February 1960, page 14, "COBOL--Common Business Oriented Language")) are: 1) the Source Program, written in a common language, and 2) the Compiler, which translates this source program into an object program capable of running on a computer.

The source language is used to specify the solution of a business data processing problem, and has three elements: procedure, data and environment. Procedure specifies the steps that the user wishes the computer to follow. Data uses "file" and "record descriptions" to describe the files of data that the object program is to manipulate or create and the individual logical records which comprise these files. Environment is the part of the source program that specifies the equipment being used.

COBOL structure

Thirty-seven characters make up the COBOL language, including numbers 0 through 9, the 26 letters of the alphabet and hyphen sign, plus seven punctuation characters and eight characters to define the operations involved in formulas and relations. COBOL words may be no longer than 30 characters, and may be nouns, verbs, or special "reserve" words. A COBOL noun is a single word which represents such things as "data name," "condition name," "procedure name," "literal name," and "special register name." Verbs are single words which designate action. Reserve words may be used for syntactical purposes only. They include "connectives," used to show the presence of a qualifier or a subscript and "noise words," used to improve the readability of the language.

Every name in the COBOL program must be unique, either because no other name has the identical spelling, or because the name exists within a hierarchy of names, all of which are used as "qualifiers" to identify the name, either as suffixes, or as prefixes.

COBOL procedures are expressed in a manner similar to English prose, but in sections, paragraphs, sentences, sequences of statements, and groups of words (usually verbs and operands) in descending order of complexity.

Three categories of data

Data to be processed falls into three categories--1) that which is contained in files and enters or leaves the internal memory of the computer from specified areas; 2) that which is developed internally and placed into intermediate or working storage; and 3) constants which are defined by the user. Files, working storage and constants all are divided into logical records (any consecutive set of information) and defined by a record description. Within a record description, the programer organizes and defines data according to its relative level by writing separate entries for each level and for each item of data within each level. The definition of a particular item of data consists of the entry written for that level plus all following entries which are of a lower level.

The Environment Division must be rewritten each time a given problem is run on a different machine. It is divided into two sections--Configuration and Input-output. The Configuration section deals with the over-all specifications of computers: the Source-Computer, which defines the computer on which the COBOL Compiler is to be run; the Object-Computer, which defines the computer on which the program produced by the COBOL Compiler is to be run; and Special Names, which relate the actual names of the hardware used by the program to the names used

in the program. The Input-output section deals with the definition of the external media: the I-O Control which defines special input-output techniques, rerun, and multiple file tapes; and File-Control, which names and associates the files with the external media.

BLESSED EVENT

A new automatic coding system for the ElectroData 220 has been produced by the combined efforts of Michigan Bell Telephone Company, Arthur D. Little, Inc. and Burroughs Corp. ElectroData Division. Naturally, the system is called BLESSED 220 for Bell Little ElectroData Symbolic System for the ElectroData 220 computer. The system is in four components: an assembly program with some compiler features; two tape editing routines, one symbolic, one absolute; and a symbolic debugging routine.

AUTOMATIC PROGRAMING STUDIES

NBS TECHNICAL NEWS BULLETIN, January 1960; pages 6, 7

One of the obstacles to the efficient use of a large computer on small problems is the communication between problem author and the programer. Although the author may have a problem well organized, he may not express it in a form that is convenient for computer programing. To remedy this situation the National Bureau of Standards has established a service called the "Black Box Computer" designed by J. H. Wegstein and G. M. Galler of the Computation Laboratory. In this operation, the computer, its operators, card handlers, key punchers, and coders make up the "computer." The service is effectively a tool for the formulator of the problem who states his problem almost as he would naturally but in such a way that the services of an expert programer are not required to translate it into conventional computer language. Instead a coder takes the problem in its original form and utilizes previously programed packages as well as other automatic programing aids in handling it.

The most useful program in the Black Box Computer so far is called Tablemaker. It is a general purpose program for reading, computing, and printing tables of numbers. In addition, this program can numerically integrate, differentiate, interpolate, and difference.

Equipment

THE RPC-4000 COMPUTER

THE OFFICE, February 1960; pages 128, 129

Royal Precision Corporation has announced the availability of the RPC-4000 computer for business and scientific use. The RPC-4000 will rent for $1750 a month or sell for $87,500. The system consists of the small computer with its magnetic drum memory, and the tape typewriter system. No site preparation or installation costs are involved. The magnetic drum memory floats on a cushion of air, and has a storage capacity of 8008 words. Up to 17 input-output devices may be connected on-line.

A SIMPLE, LOW-COST COMPUTER

THE OFFICE, February 1960; page 132

The DE-60 Computer is a small, low cost computer produced by the Clary Corporation. It is priced at $18,000 and rents for $540 per month. Suggested applications are depreciation and amortization schedules, actuarial calculations, production and inventory control, engineering work. Input is by keyboard.

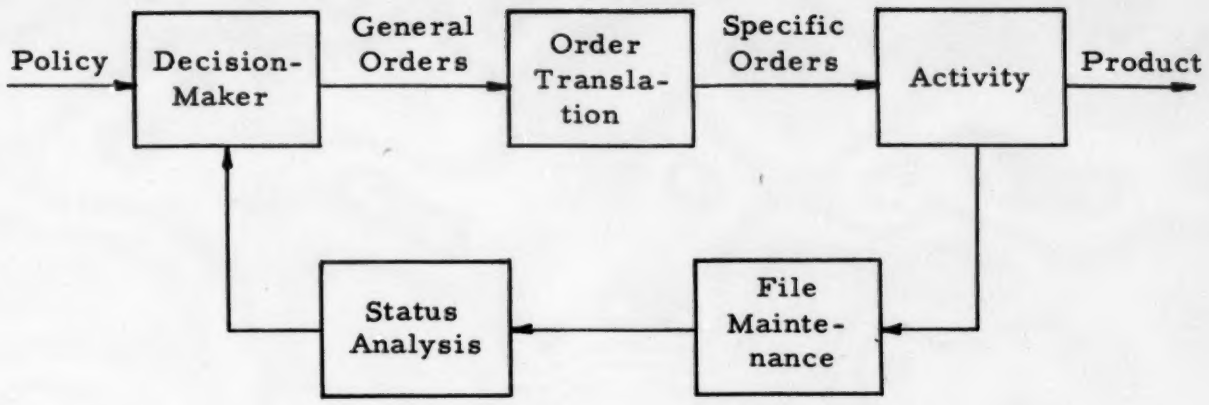
SPEEDIER COMPUTER-TO-MAN COMMUNICATION

RESEARCH FOR INDUSTRY, January-February, 1960; pages 2, 3

Some time ago the Stanford Research Institute developed for the A. B. Dick Company a high-speed printing device called the Videograph, to be added to the company's line of office duplicating machines. The Videograph uses television principles to turn out printed copy at nearly 20,000 characters a second. The question arose as to whether the Videograph could be coupled to a computer to allow the computer to deliver its data at a speed exceeding that of the customary printer. SRI engineers have now developed a "character generator" that decodes computer data. It can drive the Videograph to produce permanent copies, and also can relay the data to a television-type screen for direct viewing. The computer need not be in the immediate vicinity, but may be in another city or state from the print-out if they are connected by microwave or coaxial cable. One of the advantages of the system, in addition to its high speed, is that it allows complete freedom in the choice of type faces or symbols. This is because the characters are printed on the device's monoscope target by common photoengraving techniques, and the monoscope can be changed for a moderate cost. The entire system is relatively inexpensive.

Comment

STATUS ANALYSIS



This is a schematic representation of a management control system--highly simplified, but useful for discussion.[1] Most of the steps will be familiar. As an example, the decision maker might be a manufacturing manager who issues an order to make 1500 units per month of "Model 60." This order is translated with the aid of bills of material (or the equivalent) into production orders, purchase orders, labor requirements, etc. There is a feedback path to provide the decision-maker with information about progress in the activity. This data permits him to guide the activity in the desired direction.

Data must be in a form that is easy to read and interpret

Data processing covers the well-known functions of order translation[2] and file maintenance, and the poorly recognized function of status analysis. It is not enough to gather, file, and report data about an activity (data such as shop progress, costs). To be useful to the decision-maker, the data must be in a form he can understand and which he can compare with previously established objectives.

> Thus, status analysis is the manipulation of data from files to put it into a form that the decision-maker can most readily interpret.

Some examples of status analysis are:

- -preparation of sales volume by area, product line, customer
- -computation of accounting ratios, as current assets to current liabilities
- -computation of share-of-market figures
- -preparation of machine utilization data
- -computation of labor efficiency

Note that these processes generally involve the summarization and statistical analysis of many individual events (such as sales made, jobs worked-on).

Much operations research has gone into the difficult and long-range problem of improving decision-making. All too little has gone into the less complex but more profitable job of providing better status analysis--making more sense out of the data available for presentation to the human decision-maker. It is hoped that status analysis will become a recognized data processing function, and will receive the attention of data processing and operations research analysts it deserves.

REFERENCES

1. Sisson, R. L. "Business Systems Can Be Engineered," AUTOMATION, December 1955, page 54 ((DPD February 1956, page 4))

2. Canning, R. G., "Electronic Data Processing for Business and Industry," published by Wiley, 1956 ((DPD April 1956, page 7))

Training

Advances in Management Information & Reporting Systems, Special Forum sponsored by American Management Association

Date: May 9-11, 1960
Place: New York City (Biltmore Hotel)
Information: American Management Association, 1515 Broadway, New York 36, New York

Controlling and Exploiting Giant Computers, sponsored by University of California at Los Angeles

Date: May 23--June 4, 1960
Place: University of California (Royce Hall), Los Angeles
Information: University of California Extension, Los Angeles 24, Calif.

Operations Research Programs, sponsored by Case Institute of Technology:

Mathematics for Operations Research
Date: May 23-27, 1960

Workshop in Operations Research
Date: May 31--June 10, 1960
Place: Case Institute of Technology, Cleveland, Ohio
Information: Dr. E. Leonard Arnoff, Asst. Dir., Operations Research Group, Dept. of Mgmt., Case Institute of Technology, University Circle, Cleveland 6, Ohio

University of Michigan Summer Courses, 1960, a program of intensive non-credit courses for practicing engineers and scientists including electronic data processing

Date: June 13-24, 1960
Place: Ann Arbor, Michigan
Information: R. E. Carroll, Coordinator, Engineering Summer Courses, 2038 East Engineering Building, The University of Michigan, Ann Arbor, Michigan

Cornell University Industrial Engineering Seminars

Date: June 14-17, 1960
Place: Cornell University, Ithaca, New York
Subjects: Industrial Management, Engineering Administration, Operations Management of the Smaller Company, Work Measurement, Systems Simulation Using Digital Computers, Statistical Decision-Making: Theory and Applications, Statistical Reliability Analysis: Theory and Applications
Information: J. W. Gavett, Seminars Coordinator, Upson Hall, Cornell University, Ithaca, N. Y.

EDP Installations in Operation--A Conducted Tour of Practical Applications, sponsored by San Diego State College

Date: August 8-20, 1960
Place: Tour starts at San Diego State College and includes Los Angeles, and vicinity, San Francisco, and vicinity, with sightseeing stops at Sequoia and Yosemite.
Content: Visits to large and small computer installations and computer manufacturers. Persons without automation background can benefit, as well as those who are familiar with the subject. $135 plus meals (including bus fare and accommodations)
Course requirements: Credit for Upper or Graduate Division Status. For audit: college matriculation and consent of instructors
Registration: Dr. E. Dana Gibson, Professor, Office Management, San Diego State College, San Diego 15, California

A Development Program in O. R., sponsored by Case Institute of Technology

Date: September 20, 1960 to January 27, 1961
Place: Case Institute of Technology, Cleveland, Ohio
Information: Dr. E. Leonard Arnoff, Asst. Dir., Operations Research Group, Dept. of Mgmt., Case Institute of Technology, University Circle, Cleveland 6, Ohio

Meetings

A. I. I. E. National Conference

Date: May 12-14, 1960
Place: Dallas, Texas (Sheraton-Dallas Hotel)
Fee: $47.50, members; $57.50 non-members
Information: American Institute of Industrial Engineers, P. O. Box 914, Irving, Texas

Insurance Accounting and Statistical Association Annual Conference and Business Show

Date: May 15-18, 1960
Place: Chicago, Illinois (Sherman Hotel)
Information: I. A. S. A., P. O. Box 139, Kansas City 41, Missouri

New Dimensions for Office Executives, NOMA International Conference

Date: May 22-25, 1960
Place: Montreal, Quebec, Canada (Queen Elizabeth Hotel)
Information: National Office Management Association
Willow Grove, Pennsylvania

Automatic Computing and Data Processing in Australia, Conference sponsored by The Australian National Committee on Computation and Automatic Control

Date: May 24-27, 1960
Place: Sydney (University of Sydney and University of New South Wales)
C. H. D. Harper, c/o The Institution of Engineers, Science House, 157 Gloucester Street, Sydney, N. S. W., Australia

Western Systems Conference, sponsored by Systems and Procedures Association Chapters of Southern California

Date: May 26, 1960
Place: Los Angeles, California (Statler Hilton Hotel)
Information: George Ryan, 6986 Bandini Blvd., Los Angeles 22, California

Conference, The Computing and Data Processing Society of Canada

Date: June 6, 7, 1960
Place: University of Toronto
Information: J. H. Aitchison, 600 Eglinton Ave., E. Toronto, Ontario, Canada

International Accounting Conference, sponsored by National Association of Accountants

Date: June 19-22, 1960
Place: New Orleans, La. (Hotel Roosevelt)
Information: National Association of Accountants, 505 Park Avenue, New York 22, New York

National Machine Accountants Association National Conference

Date: June 22-24, 1960
Place: San Francisco, California
On Tuesday, June 21, a pre-conference tour will be conducted to outstanding data processing centers in nearby areas. In addition to the regular meetings, a Hall of Discussions will be held during the conference which will feature questions of general interest discussed informally. Following the conference, registrants may continue to Honolulu for a two-day meeting beginning on Monday, June 27, featuring data processing experts from the Pacific Basin and Asia.
Information: Address inquiries to 1960 National Conference, NMAA, P. O. Box 3617, Rincon Annex, San Francisco 19, California

"Automation in Business Decision Processes," conference sponsored by Los Angeles Chapter of Association for Computing Machinery

Date: June 23, 1960
Place: University of California at Los Angeles

Conference, British Computer Society, Ltd.
Date: July 4-7, 1960
Place: Harrogate, Yorks, England
Information: Miss D. E. Pilling, Electronic Computing Laboratory, The University, Leeds 2, England

Symposium on Computers and Data Processing, sponsored by University of Denver
Date: July 28, 29, 1960
Place: Estes Park, Colorado, Stanley Hotel
Information: W. H. Eichelberger, Denver Research Institute University Park, Denver 10, Colorado

National ACM Conference
Date: August 23-25, 1960
Place: Marquette University, Milwaukee, Wisconsin

SHARE XV Meeting
Date: September 12-16, 1960
Place: Pittsburgh, Pa. (Pittsburgh Hilton Hotel)
Information: E. B. Weinberger, Gulf Research & Development Co., Drawer 2038, Pittsburgh 30, Pa.

Univac Users Association
Date: September 22, 23, 1960
Place: Washington, D. C.

NABAC National Convention
Date: October 10-12, 1960
Place: Los Angeles, California
Information: NABAC, The Association for Bank Audit, Control and Operation, 38 South Dearborn St., Chicago 3, Illinois

International Systems Meeting, sponsored by Systems and Procedures Association
Date: October 10-12, 1960
Place: New York, N. Y. (Hotel Commodore)
Information: Systems and Procedures Association, 4463 Penobscot Building, Detroit 26, Michigan

Computer Applications Symposium, sponsored by Armour Research Foundation
Date: October 26, 27, 1960
Place: Chicago, Illinois (Morrison Hotel)
Information: Andrew Ungar, Armour Research Foundation, 10 West 35th Street, Chicago 16, Illinois

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References

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American Management Association
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New York 36, New York

Armed Forces Comptroller
516 North Oxford Street
Arlington 3, Virginia

Automatic Data Processing
Mercury House
109-119 Waterloo Rd.
London SE1, England

Best's Life News
75 Fulton Street
New York 38, New York

Chemical Engineering Progress
25 West 45th Street
New York 36, New York

Computers and Automation
815 Washington Street
Newtonville 60, Mass.

The Controller
Two Park Avenue
New York 16, New York

Iliffe & Sons Ltd.
Dorset House, Stamford St.
London SE 1, England

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I. A. S. A.
P. O. Box 139
Kansas City 41, Missouri

Management & Business Automation
600 West Jackson Blvd.
Chicago 6, Illinois

Management Review
1515 Broadway
New York 36, New York

Navy Management Review
Supt. of Documents
U. S. Government Printing Office
Washington 25, D. C.

NBS Technical News Bulletin
Supt. of Documents
U. S. Gov't Printing Office
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232 Madison Avenue
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Office Automation News Bulletin
155 Fifth Avenue
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Philosophical Library Inc.
15 East 40th Street
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Systems Magazine
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315 Fourth Avenue
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